

AN ASSESSMENT OF KNOWLEDGE AND ADOPTION LEVEL OF FARMERS ON ONION PRODUCTION TECHNOLOGIES

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ABSTRACT

India was the second largest producer of onion in the world and occupies first position in acreage and third in export. It contributes 11.35 per cent to the total World production (FAO, 1998). One of the major onion growing states was Tamil Nadu. In Tamil Nadu the districts viz., Tiruchirappalli, Dindigul, Namakkal, Coimbatore, Erode, Virudhunagar, Tirunelveli, Thoothukudi and Salem were the major onion cultivation area which contribute nearly 75 per cent of the total onion production in Tamil Nadu with a productivity of 12 tones' per hectare. An understanding about the various characteristics of the onion growers and knowledge about the cultivation technologies in onion would enable extension workers to develop appropriate strategies to educate the farmers and to inculcate the required knowledge to improve their adoption. Hence, Tirunelveli district was purposively selected for the study; as it stands seventh position in Tamil Nadu with 2255.31 ha under onion cultivation. Out of 19 blocks of Tirunelveli district, blocks with major cultivation area, namely Keelapavoor and Alangulam were selected. A random sample of 120 farmers (60 farmers from each block) cultivating onion in the selected villages (5 villages in each block) were considered for the study. The data was gathered through pre-tested interview schedule and subjected to percentage analysis. The level of knowledge and adoption of the farmers in onion cultivation is found to be almost similar with knowledge level slightly higher than adoption in all the categories.

KEYWORDS: Onion Growers, Tirunelveli, Knowledge, Adoption & Onion Cultivation Technologies

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INTRODUCTION

The genus onion (*Allium cepa* L.), one of the most important vegetable crops world-wide, belongs to the family Amaryllidaceae or Alliaceae comprising 780 species (Burnie et al., 1999) distributed throughout the world.

India was the second largest producer of onion in the world. India occupies first position in acreage and third in export. Further, it is contributing to about 11.35 per cent to the total World production (FAO, 1998). About 170 countries of the world cultivate onion for domestic use while some also grow onions for trade. About 9.2 million acres of onion were harvested each year on a global scale and 8% of this harvest was internationally traded.

The country's onion production was estimated to decline by 4.5 per cent to 21.4 million tonnes in the past 2016-17 crop year due to lower acreage, as per the agriculture ministry data released today. The country had harvested 22.4 million tonnes in the last 2016-17 crop years. During the year 2017-2018 is estimated at 23.26 million tonnes as against 22.4 million tonnes in 2016-2017 (Ministry of Agriculture and farmers Welfare,

Government of India, 2018).

One of the major onion growing states was Tamil Nadu. In Tamil Nadu the districts viz., Tiruchirappalli, Dindigul, Namakkal, Coimbatore, Erode, Virudhu Nagar, Tirunelveli, Thoothukudi and Salem were the major onion cultivation area. It occupied nearly 75 per cent of the total onion production in Tamil Nadu with a productivity of 12 tones' per hectare. According to the trade sources nearly 70 per cent of area was occupied by small onion and remaining 30 per cent was by Bellary onion. CO1, CO2, CO3, CO4, CO (On) 5, MDU 1 and Bangalore rose were important small onion varieties raised by farmers.

The onion grows under Tamil Nadu condition, normally twice a year during April-May and October –November and preferred varieties are Co (On) 5, Bellary Red. In Tirunelveli district onion cultivation was under an area of 2255.31 ha which stand seventh position in Tamil Nadu. (Source: Joint Director of Horticulture, Tirunelveli).

Need of the Study

It is normally observed that farmers do not adopt the entire package of practices recommended for a particular crop. An understanding about the various characteristics of the onion growers would provide valuable guide lines in formulating programs for different clientele. Knowledge about the cultivation technologies in onion would enable extension workers to develop appropriate strategies to educate the farmers and to inculcate the required knowledge to improve their adoption. So findings of the research on adoption of onion cultivation will help the extension workers to launch special schemes to popularize such practices which are found to be less in adoption.

METHODOLOGY

The study was focused on Onion cultivation technologies among Onion growers in Tirunelveli District of Tamil Nadu. Tirunelveli district was purposively selected for the study; as it stands seventh position in Tamil Nadu with 2255.31 ha under onion cultivation. Tirunelveli district comprised of 19 blocks out of which, 2 blocks were selected based on the major cultivation area, namely Keelapavoor and Alangulam where in 1058.79 ha and 337.62 under onion cultivation respectively. Five villages from each block having maximum area under onion were selected for the study. Thus, the selected villages under Keelapavoor Block were Keelapavoor-II, Keelapavoor-I0, Melapavoor, Kaluneerkulam, Avudaiyanoor; Villages selected under Alangulam Block were Veeranam, Akaram, Melakalangal, Alangulam, and Maranthai. Further data on farmers cultivating onion in the selected villages were gathered and in each block 60 farmers were selected randomly which constitute total sample size of 120 farmers. The 120 respondents were identified from the selected villages

Then the required number of farmers practising onion cultivation were selected by using random sampling method as follows

Table 1

S.No	Name of Blocks	Number of Onion Growers	Proportionate Sample Size Selected
1.	Keelapavoor	1315	60
2.	Alangulam	1162	60
Total		2477	120

RESULTS AND DISCUSSIONS

Knowledge Level of Farmers on Onion Cultivation

Knowledge is an indispensable criterion for the adoption of any innovation, as it enables the farmers to understand completely and clearly the recommended technologies. The rate of adoption of an innovation is directly linked with the level of knowledge of user about the same. Hence it was felt necessary to know the knowledge level of the farmers to understand all aspects of the technologies that were taught to them. In the present study, knowledge has been operationalized as the body of understanding the information possessed by the respondents on cultivation of onion.

Distribution of Knowledge

Knowledge level of farmers on onion cultivation were studied with the characteristics like variety, season of planting, soil type, spacing, irrigation schedule, seed rate, FYM application, application of NPK fertilizer, raising seedlings, transplantings, fertigation, applying weedicides and harvesting practices and the results were tabulated in Table 2.

Table 2: Knowledge Level of Farmers on Onion Cultivation

S.No.	Recommended Technologies	Number	Percent
I	Season and varieties		
1.	Season of planting (April – May), (Oct –Nov)	120	100.00
2.	Varieties	83	69.16
II	Soil type (Red loam to Black soil)	102	85.00
III	Land preparation		
3.	Ploughing the main field	120	100.00
4.	Preparation of field (Ridges & furrows @spacing 45cm)	104	86.66
IV	Nutrient management		
5.	FYM application	93	77.50
6.	Application of fertilizer in splits	92	76.66
7.	Fertigation (Azospirillum and Phosphobacteria each @ 2 Kg/ha along with FYM 50 Kg Neem cake @ 100 kg are applied before last ploughing)	67	55.83
V	Sowing practices		
8.	Seed rate (8kg /ha)	59	49.16
9.	Medium sized bulbs	113	94.16
10.	Raising seedlings and transplanting	106	88.33
V	Spacing and irrigation		
11.	Spacing	102	84.19
12.	Irrigation schedule (daily once, three days once, weekly once)	120	100.00
VII	Weed management		
13.	i) Applying weedicide (Atrazine)	93	77.50
	ii) Hoeing, Hand weeding and Earthing up	108	90.00
VIII	Harvesting practices		
14.	Harvesting stage (leafy green tops begin to yellow)	120	100.00
IX	Pests		
15.	Control for Thrips and Onion fly (Acephate 70SP 500 ml/ha)	92	76.66
16.	Control for cut worm	59	49.16
X	Diseases		
17.	Control for Leaf spot (Mancozeb 2gm/ltr)	103	85.83
18.	Control for Basal rot (Carbendazin, Hexaconazole 0.1%, 1gm/ltr)	101	84.16
19.	IPM practices for pest and disease management (barrier crop of maize, pheromone and sticky traps.	78	65.00

Knowledge Level of Crop Improvement Technology

Season

Indian onions have two crop cycles, first harvesting starts in October to January and the second harvesting from January to May.

It could be seen from the table 2 that cent per cent of the onion growers having knowledge about season of planting from April – May and October – November followed by 69.16 per cent of the farmers having knowledge about the recommended variety like Co (On) 5, Bellary Red.

Soil Type

Onion can be grown in all types of soils such as sandy loam, clay loam, silt loam and heavy soils. However, the best soil for successful onion cultivation is deep, friable loam and alluvial soils with good drainage, moisture holding capacity and sufficient organic matter.

85.00 per cent of the farmers were knowledgeable about the soil type, which is suitable for onion cultivation.

Knowledge Level of Crop Production Technology

Prior to transplanting, field should be ploughed and disked properly to eliminate debris and soil clods. Broad bed furrows (BBF) of 15 cm height and 120 cm top width with 45 cm furrow are formed to achieve proper spacing and population density.

100 per cent of the farmers having knowledge about ploughing the main field followed by 86.66 per cent of the farmers were knowledgeable about preparation of field by making ridges and furrows. Onions can be grown from seeds, seedlings and bulblets.

Most of the farmers (94.16 %) having knowledge about medium size bulb for onion cultivation followed by 88.33 per cent of the farmers raising seedlings and transplanting for onion cultivation and only 38.33 per cent of cultivators having knowledge about recommended seed rate. Irrigation requirement of onion depends upon the season, soil type, method of irrigation and age of the crop. In general, onion needs irrigation at the time of transplanting, three days after transplanting and subsequently at 7-10 days interval depending upon the soil moisture.

Irrigation schedule were known to all the farmers followed by 84.19 per cent of the farmers having knowledge about recommended spacing.

Adoption Level of Manures and Fertilizers

Organic manures equivalent to 75 kg N/ha approximately FYM 15 t/ha or poultry manure 7.5 t/ha or vermicompost 7.5 t/ha should be incorporated at the time of last ploughing and beds with appropriate size should be prepared after levelling.

One third of recommended N and full dose of P_2O_5 and K_2O are applied at the time of planting while remaining two third N is applied in two equal splits at 30 and 45 days after planting. Fertigation is an effective and efficient method of applying fertilizers through drip irrigation which is used as the carrier and distributor of irrigation water and crop nutrients. 77.50 per cent of the farmers having knowledge about FYM application followed by 66.16 per cent of farmers knowledgeable about their NPK fertilizer in split doses and 55.83 per cent of the farmers known about importance of fertigation.

Knowledge Level of Weed Management

Controlling weed development during the onion crop cycle is essential to obtain high yields and marketable products. Onions do not compete well with weeds they are slow growing and can suffer from successive flushes of weeds; they have narrow upright leaves which do not shade out weeds that emerge in the rows.

Most of the farmers (77.50 %) knowledgeable about applying weedicides to control weeds followed by 90 per cent of the farmers doing practices like hoeing, hand weeding and earthing up to control weeds.

Knowledge Level of Pest and Disease Management

Pest and disease management is crucial for obtaining higher marketable bulb yield and good quality bulbs. Most of the farmers aware about the pest and diseases in onion cultivation, major pest in my study area was thrips, onion fly, cut worm and major diseases in my study area was leaf spot and basal rot.

76.66 per cent of the farmers were knowledgeable about control measures for thrips and onion fly followed by 42.5 per cent of the farmers known about the control measures for cut worm.

85.83 per cent of the farmers knowledgeable about control measures for leaf spot followed by 84.16 per cent of the farmers known about their control measures for basal rot and IPM practices known by 65.00 per cent of the onion growers.

Adoption Level of Farmers on Onion Cultivation

The adoption levels of farmers on onion cultivation were studied and the results were tabulated.

Table 3: Adoption Level of Farmers on Onion Cultivation

S. No.	Recommended Technologies	Number	Per Cent
I	Season and Varieties		
1.	Season of planting (April – May), (Oct –Nov)	120	100.00
2.	Varieties	62	51.66
II	Soil type (Red loam to Black soil)	98	81.66
III	Land Preparation		
3.	Ploughing the main field	120	100.00
4.	Preparation of field (Ridges & furrows @spacing 45cm)	101	84.16
IV	Nutrient Management		
5.	FYM application	90	75.00
6.	Application of NPK fertilizer in splits	76	63.33
7.	Fertigation (Azospirillum and Phosphobacteria each @ 2 Kg/ha along with FYM 50 Kg Neem cake @ 100 kg are applied before last ploughing)	30	25.00
V	Sowing Practices		
8.	Seed rate (8kg /ha)	46	38.33
9.	Medium sized bulbs	98	81.66
10.	Raising seedlings and transplanting	67	51.83
V	Spacing and Irrigation		
11.	Spacing	100	83.33
12.	Irrigation schedule (daily once, three days once, weekly once)	120	100.00
VII	Weed Management		
13.	i) Applying weedicide (Atrazine)	84	70.00
	ii) Hoeing, Hand weeding and Earthing up	95	79.16
VIII	Harvesting Practices		
14.	Harvesting stage (leafy green tops begin to yellow)	120	100.00

Table 3: Contd.,			
IX	Pests		
15.	Control for Thrips and Onion fly (Acephate 70SP 500 ml/ha)	75	62.50
16.	Control for cut worm	51	42.50
X	Diseases		
17.	Control for Leaf spot (Mancozeb 2gm/ltr)	103	85.83
18.	Control for Basal rot (Carbendazin, Hexaconazole 0.1%, 1gm/ltr)	84	70.00
19.	IPM practices for pest and disease management (barrier crop of maize, pheromone and sticky traps.	64	53.33

The level of knowledge and adoption of the farmers in onion cultivation is found to be almost similar with knowledge level slightly higher than adoption in all the categories.

Adoption Level of Crop Improvement Technology

It could be seen from the table that cent per cent of the onion growers adopt the season of planting from April – May and October – November followed by 51.66 per cent of the farmers cultivated the recommended variety

Adoption Level of Crop Production Technology

81.66 per cent of the farmers were known about the soil type, which is suitable for onion cultivation. Ploughing the main field was adopted by 100 per cent of the farmers followed by 86.66 per cent of the farmers were adopted to preparation of field by making ridges and furrows. Most of the farmers 81.66 per cent adopted medium size bulb for onion cultivation followed by 51.83 per cent of the farmers raising seedlings and transplanting for onion cultivation and only 38.33 per cent of cultivators adopted the recommended seed rate. Irrigation schedule were followed by all the farmers followed by 83.33 per cent of the farmers was adopted to the spacing. The findings are in accordance with that findings of Bagyajanani, P (2016).

Adoption Level of Manures And Fertilizers

During cultivation application of FYM was adopted by 75 per cent of the farmers, more than half of the onion growers 63.33 per cent was adopted to the NPK fertilizers in split doses followed by one fourth of the onion growers (25.00%) adopted fertigation practices. Most of the farmers (70.00 %) applying weedicides to control weeds followed by 79.16 per cent of the farmers doing practices like hoeing, hand weeding and earthing up to control weeds.

ADOPTION LEVEL OF PLANT PROTECTION TECHNOLOGIES

Most of the farmers aware about the pest and diseases in onion cultivation, major pest in my study area was thrips, onion fly, cut worm and major diseases in my study area was leaf spot and basal rot 76.66 per cent of the farmers were adopted control measures for thrips and onion fly followed by 42.5 per cent of the farmers adopt the control measures for cut worm.

73.33 per cent of the farmers were adopted control measures for leaf spot followed by 70.00 per cent of the farmers were adopt control measures for basal rot and IPM practices adopted by 53.33 per cent of the onion growers.

CONCLUSIONS

Tirunelveli being the seventh district in acreage of onion production it has to implement more development measures for onion growers. Farmers had more knowledge on onion cultivation but they were unable to adopt

recommended technologies because of lack of source on information, inputs and funds. More schemes for providing loans to be enacted. Half of the farmers were traditional in practising onion cultivation such that they were lagging in adopting new technologies. Hence, more training campaigns should be conducted for them to enhance their knowledge and to improve their adoption level.

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